WHAT IS CLAIMED IS:

1. A method of transmitting data packets over a synchronous wireless link comprising:

sending a headerless data packet on the synchronous wireless link, a sequential timer-based value being associated with the headerless data packet;

receiving the headerless data packet from the synchronous wireless link;

decompressing, based at least in part on the sequential timer-based value associated with the received headerless data packet, the header of the received headerless data packet;

repeating at least once the steps of sending the headerless data packet, receiving, and decompressing; and

sending a data packet having a header on the synchronous wireless link.

2. The method of claim 1, further comprising assessing radio-bearer limitations of the synchronous wireless link.

3. The method of claim 2, wherein the step of assessing further comprises determining whether a size of the payload will permit a data packet having a header to be sent on the synchronous wireless link.

4. The method of claim 3, wherein the step of assessing further comprises determining a maximally-sized header that can be sent on the synchronous wireless link.

5. The method of claim 3, wherein the period of sending of the data packet having the header varies in response to the step of determining whether the size of the payload will permit a data packet having a header to be sent on the synchronous wireless link.

6. The method of claim 2, wherein the step of assessing is performed on a data-packet-by-data-packet basis.

7. The method of claim 1, wherein the step of sending the data packet having the header is performed due to a talk spurt.

8. The method of claim 7, wherein the data packet having the header comprises a compressed header.

9. The method of claim 1, wherein the data packet having the header comprises a compressed header.

10. The method of claim 1, wherein the method operates according to at least one of GSM/GPRS, WCDMA, cdma2000, and TDMA (IS-136).

11. The method of claim 7, further comprising:

analyzing properties of a plurality of previously-sent data packets;

based on the analysis, predicting that a talk spurt is about to occur; and

wherein the step sending the data packet having the header on the synchronous wireless link is performed in response to the prediction.

12. The method of claim 7, further comprising:

buffering a plurality of data packets;

examining the plurality of data packets to determine whether a talk spurt is occurring; and

wherein the step of sending the data packet having the header on the synchronous wireless link is performed in response to a determination that a talk spurt is occurring and prior to sending of a first data packet including the talk spurt.

13. The method of claim 1, wherein the step of sending the data packet having the header is performed periodically.

14. The method of claim 13, wherein the data packet having the header comprises a compressed header.

15. The method of claim 13, wherein the step of sending the data packet having the header comprises:

determining a maximally-sized header that can be sent on the synchronous wireless link;

in response to a determination that no header can be sent, sending at least one headerless data packet; and

in response to a determination that a data packet having a header can be sent, sending a data packet having a header not exceeding the maximally-allowable size.

16. The method of claim 1, wherein the step of decompressing comprises timer-based decompression of at least one dynamic part of the header of the received headerless data packet.

17. The method of claim 16, wherein the at least one dynamic part comprises at least one of an RTP Sequence Number, an RTP Timestamp, and an IP-Identifier.

18. The method of claim 1, wherein the step of sending the data packet having the header is performed in response to a determination that a value of a slowly-varying field in a removed header has changed from an earlier value thereof.

19. The method of claim 18, wherein the data packet having the header comprises a compressed header.

20. The method of claim 1, wherein the step of sending the data packet having the header is performed in response to feedback indicating that the sequential timer-based value associated with the received headerless data packet is not the sequential timer-based value expected.

21. The method of claim 20, wherein the data packet having the header comprises a compressed header.

22. The method of claim 1, wherein the sequential timer-based value comprises at least one of an RTP Sequence Number, an RTP Timestamp, and an Internet protocol identifier.

23. The method of claim 1, further comprising removing a header from a data packet comprising a payload and the header, thereby creating a headerless data packet.

24. The method of claim 1, wherein the step of decompressing comprises timer-based decompression.

25. The method of claim 1, wherein the header is sent as primary traffic.

26. The method of claim 1, wherein the header is sent as signaling traffic.

27. The method of claim 1, wherein the header is sent as secondary traffic.

28. A system for sending and receiving data packets comprising:

a first node adapted to:

send a headerless data packet toward a second node via a synchronous wireless link, a sequential timer-based value being associated with the headerless data packet; and

send a data packet having a header on the synchronous wireless link; and

a second node adapted to:

receive the headerless data packet via the synchronous wireless link; and

decompress, based at least in part on the sequential timer-based value associated with the received headerless data packet, a header of the received headerless data packet;

receive the data packet having the header; and

a synchronous wireless link between the first node and the second node.

29. The system of claim 28, wherein the first node is adapted to assess radio-bearer limitations of the synchronous wireless link.

30. The system of claim 29, wherein the first node is adapted to determine whether a size of the payload will permit a data packet having a header to be sent by the first node on the synchronous wireless link.

31. The system of claim 30, wherein the first node is adapted to determine a maximally-sized header that can be sent by the first node on the synchronous wireless link.

32. The system of claim 30, wherein the period of sending of the data packet having the header varies in response to the determination by the first node whether the size of the payload will permit a data packet having a header to be sent on the synchronous wireless link.

33. The system of claim 29, wherein the assessment is performed on a data-packet-by-data-packet basis.

34. The system of claim 28, wherein the first node is adapted to send the data packet having the header due to a talk spurt.

35. The system of claim 28, wherein the system operates according to at least one of GSM/GPRS, WCDMA, cdma2000, and TDMA (IS-136).

36. The system of claim 28, wherein the data packet having the header comprises a compressed header.

37. The system of claim 34, wherein the first node is further adapted to

analyze properties of a plurality of previously-sent data packets;

based on the analysis, predict that a talk spurt is about to occur; and

send the data packet having the header on the synchronous wireless link in response to the prediction.

38. The system of claim 34, wherein the first node is further adapted to:

buffer a plurality of data packets;

examine the plurality of data packets to determine whether a talk spurt is occurring; and

send the data packet having the header on the synchronous wireless link in response to a determination by the first node that a talk spurt is occurring and prior to sending by the first node of a first data packet including the talk spurt.

39. The system of claim 28, wherein the data packet having the header is sent periodically.

40. The system of claim 29, wherein the first node is further adapted to:

determine a maximally-sized header that can be sent on the synchronous wireless link;

in response to a determination that no header can be sent, send at least one headerless data packet; and

in response to a determination that a data packet having a header can be sent, send a data packet having a header not exceeding the maximally-allowable size.

41. The system of claim 29, wherein the data packet having the header comprises a compressed header.

42. The system of claim 28, wherein the first node comprises a base station adapted to operate according to global system for mobile communications (GSM) enhanced data for GSM evolution (EDGE).

43. The system of claim 42, wherein the second node comprises a mobile station adapted to operate according to EDGE.

44. The system of claim 28, wherein the first node comprises a base station adapted to operate according to time-division-multiple access (TDMA).

45. The system of claim 44, wherein the second node comprises a mobile station adapted to operate according to TDMA.

46. The system of claim 28, wherein the decompression comprises timer-based decompression of at least one dynamic part of the header of the received headerless data packet.

47. The system of claim 46, wherein the at least one dynamic part comprises at least one of an RTP Sequence Number, an RTP Timestamp, and an IP-Identifier.

48. The system of claim 28, wherein a connection between the first node and the second node is a PPP-free connection.

49. The system of claim 48, wherein the PPP-free connection permits establishment of a second R-P session connected to a null-RLP over the synchronous wireless link.

50. The system of claim 28, wherein the first node comprises a mobile station adapted to operate according to cdma2000.

51. The system of claim 28, wherein the second node comprises a mobile station adapted to operate according to cdma2000.

52. The system of claim 28, wherein the first node comprises a packet data service node (PDSN) adapted to operate according to cdma2000.

53. The system of claim 28, wherein the second node comprises a packet data service node (PDSN) adapted to operate according to cdma2000.

54. The system of claim 28, wherein the first node comprises a base station adapted to operate according to cdma2000.

55. The system of claim 28, wherein the second node comprises a base station adapted to operate according to cdma2000.

56. The system of claim 28, wherein the sequential timer-based value comprises at least one of an RTP Sequence Number, an RTP Timestamp, and an Internet protocol identifier.

57. The system of claim 28, wherein the decompression comprises timer-based decompression.

58. The system of claim 28, wherein the first node is further adapted to remove a header from a data packet comprising a payload and the header, thereby creating a headerless data packet.

59. The system of claim 28, wherein the second node comprises a base station.

60. The system of claim 28, wherein the first node comprises a mobile station.

61. The system of claim 28, wherein the first node is adapted to send the data packet having the header in response to a determination that a value of a slowly-varying field in a removed header has changed from an earlier value thereof.

62. The system of claim 61, wherein the data packet having the header comprises a compressed header.

63. The system of claim 28, wherein the first node is adapted to send the data packet having the header in response to feedback from the second node indicating that the sequential timer-based value associated with the received headerless data packet is not the sequential timer-based value expected by the second node.

64. The system of claim 28, wherein the header is sent as primary traffic.

65. The system of claim 28, wherein the header is sent as secondary traffic.

66. The system of claim 28, wherein the header is sent as signaling traffic.

67. The system of claim 63, wherein the data packet having the header comprises a compressed header.

68. A node in a wireless communication system, the node comprising:

a transmitter adapted to:

send a first headerless data packet via a synchronous wireless link, a sequential timer-based value being associated with the headerless data packet; and

send a first data packet having a header on the synchronous wireless link;

a receiver adapted to:

receive a second headerless data packet via the synchronous wireless link; and

receive a second data packet having a header; and

a decompressor adapted to decompress, based at least in part on the sequential timer-based value associated with the first headerless data packet, the header of the first headerless data packet.

69. The node of claim 68, wherein the node is adapted to determine whether a size of the payload will permit the first data packet having a header to be sent by the node on the synchronous wireless link.

70. The node of claim 69, wherein the node is adapted to determine a maximally-sized header that can be sent by the node on the synchronous wireless link.

71. The node of claim 69, wherein the period of sending of the first data packet having the header varies in response to the determination by the node whether the size of the payload will permit a data packet having a header to be sent on the synchronous wireless link.

72. The node of claim 68, wherein the node is adapted to periodically send the first data packet having a header.

73. The node of claim 68, wherein the node operates according to at least one of GSM/GPRS, WCDMA, cdma2000, and TDMA (IS-136).

74. The node of claim 68, wherein at least one of the first data packet having a header and the second data packet having a header is sent due to a talk spurt.

75. The node of claim 68, wherein the first data packet having the header is sent in response to feedback indicating that the sequential timer-based value is not an expected sequential timer-based value.

76. The node of claim 68, wherein the first data packet having the header is sent in response to a determination that a value of a slowly-varying field has changed from an earlier value thereof.

77. The node of claim 68, wherein the second data packet having a header comprises a compressed header.

78. The node of claim 68, further comprising a compressor adapted to remove a header from a data packet comprising a payload and the header, thereby creating the first headerless data packet.

79. The node of claim 68, wherein the sequential timer-based value comprises at least one of an RTP Timestamp, an RTP Sequence Number, and an Internet protocol identifier.

80. The node of claim 68, wherein the header is sent as primary traffic.

81. The node of claim 68, wherein the header is sent as secondary traffic.

82. The node of claim 68, wherein the header is sent as signaling traffic.

83. A method of transmitting a header update comprising:

checking a packet payload size;

determining whether the packet payload size permits transmission of a header with the packet;

in response to a determination that the packet payload size permits transmission of a header with the packet, transmitting a header with the packet;

in response to a determination that the packet payload size does not permit transmission of a header with the packet, transmitting a headerless data packet.

84. The method of claim 83, wherein the step of checking is performed in response to expiration of at least one of a timer and a packet counter.

85. The method of claim 84, wherein at least one of the timer and the packet counter is reset and started in response to transmission of a headerless data packet.

86. The method of claim 83, further comprising the steps of:

determining whether the packet payload size of the subsequent packet permits transmission of a header with the subsequent packet;

in response to a determination that the packet payload size of the subsequent packet permits transmission of a header with the subsequent packet, transmitting a header with the subsequent packet;

in response to a determination that the packet payload size of the subsequent packet does not permit transmission of a header with the subsequent packet, transmitting a headerless data packet.

87. The method of claim 83, wherein each of the steps of determining comprises comparing a packet payload size to a frame size.

88. The method of claim 83, further comprising the step of checking a packet payload size of a subsequent packet in response to the step of transmitting the headerless data packet.

89. The method of claim 83, wherein the step of determining comprises comparing the packet payload size to a frame size.

90. The method of claim 83, wherein the header comprises a compressed header.

91. The method of claim 83, wherein the header is sent as primary traffic.

92. The method of claim 83, wherein the header is sent as secondary traffic.

93. The method of claim 83, wherein the header is sent as signaling traffic.

94. A method of transmitting a header update comprising:

delaying a sequence of data packets;

determining whether the delayed sequence of data packets comprises a talk spurt;

in response to a determination that the delayed sequence comprises a talk spurt, transmitting a header update prior to transmission of the delayed sequence of data packets.

95. The method of claim 94, further comprising transmitting the delayed sequence of data packets.

96. The method of claim 94, wherein the talk spurt comprises a plurality of data packets having a maximal payload size.

97. The method of claim 94, wherein the header update comprises a compressed header.

98. The method of claim 94, wherein the header update comprises primary traffic.

99. The method of claim 94, wherein the header update comprises secondary traffic.

100. The method of claim 94, wherein the header update comprises signaling traffic.

101. A method of transmitting a header update comprising:

transmitting a sequence of data packets;

determining whether at least one property of the transmitted sequence of data packets predicts a talk spurt;

in response to a determination that the at least one property of the transmitted sequence predicts a talk spurt, transmitting a header update prior to transmission of a first data packet of the predicted talk spurt.

102. The method of claim 101, further comprising transmitting a plurality of data packets comprising the predicted talk spurt.

103. The method of claim 101, wherein the predicted talk spurt comprises a plurality of data packets having a maximal payload size.

104. The method of claim 101, wherein the header update comprises a compressed header.

105. The method of claim 101, wherein the header update comprises primary traffic.

106. The method of claim 101, wherein the header update comprises secondary traffic.

107. The method of claim 101, wherein the header update comprises signaling traffic.